WEST BOYLSTON WACHUSETT NO. 47 SUBSTATION
TESTIMONY OF ANDRES J. MOLINA

Q. Please state your full name, business address and position with respect to the petitioning company.

A. My name is Andres J. Molina, and my business address is 55 Bearfoot Road, Northborough, Massachusetts. I am a Principal Engineer with National Grid USA Service Company, Inc., a National Grid Company, and I provide engineering services to New England Power Company (NEP or the Company).

Q. What are your qualifications to testify in these proceedings?

A. I received a Bachelor of Science in Electrical Engineering from Worcester Polytechnic Institute in 1982 and a Master of Science in Electrical Engineering from Northeastern University in 1985. I am a registered professional engineer in the Commonwealth of Massachusetts. I have over fifteen years experience in the engineering, design, construction and operation of electric power systems. For the last nine years I have worked in the Substation Design & Engineering Department of National Grid USA Service Company, Inc. which is responsible for the engineering, design and construction of NEP's substations.

Q. Have you testified before the Department of Telecommunications and Energy?

A. Yes, I testified in DTE-01-77 regarding the Westford No. 57 Substation.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to summarize the Company's proposal to construct and operate additional electrical facilities at the Company's Wachusett No. 47 Substation, located at 53 Temple Street (Route 140), Boylston, Massachusetts. I will also give a brief overview of the associated transmission line relocation project.

Q. What are your responsibilities for this project?

A. I am the Project Engineer.

Q. What is the investment estimate for this project?

A. The study-grade estimate for this project is $28,000,000. Study-grade estimates are developed with only a conceptual understanding of the project. They are prepared using historical data, data from similar projects

and other stated assumptions of the Project Engineer. The accuracy of study-grade estimates is expected to be +/- 25%.

Q. Referring to whatever exhibits you wish for the purposes of illustration, will you please describe for the record the proposed expansion of the Wachusett No. 47 Substation?

A. The Company owns a parcel of land of approximately 14.26 acres off Temple Street as shown on Exhibit AJM-1, Aerial Photo of Wachusett No. 47 Substation (the Site). The New England Power Company Sandy Pond-to-Millbury right-of-way traverses the Site from North to South. The right-of-way is populated by two 345 kV lines (341 & 343), two 115 kV (O-141 & P-142) lines, and three 69 kV (A-53, B-54 & L-38) lines.

The Site currently houses a 115/69 kV transmission substation consisting of a 50' tall terminal structure for 115 kV lines P-141 & O-141, a 40/53/66 MVA – 115/69 kV autotransformer and five 69 kV – 1200 A breakers arranged in two bays and supplying 69 kV lines A-53, B-54 and L-38. The substation occupies an area of approximately 1.6 acres.

The Company is proposing to convert Wachusett No. 47 into a 345/115/69 kV transmission substation by installing the equipment shown on Exhibit AJM-2, Proposed Site Plan. The ultimate layout will consist of :

a. Two 95' tall terminal structures for 345 kV lines 341 and 343,

b. A pre-engineered metal building measuring approximately 180'L x 60' W x 36'H, including the foundation. This building will house 345 kV gas insulated switchgear (GIS) consisting of twelve 345 kV – 4000 A breakers and associated equipment, arranged in three bays,

c. Four 269/358/448 MVA – 345/115 kV autotransformers,

d. Two 60' tall terminal structure for 115 kV lines P-141 & O-141,

e. A pre-engineered metal building measuring approximately 180'L x 50' W x 36'H, including the foundation. This building will house 115 kV gas insulated switchgear (GIS) consisting of twelve 115 kV – 3000 A breakers and associated equipment, arranged in three bays. An attached building measuring 80'L x 40'W x 20'H, including the foundation, will house relay, communication and control equipment for the entire substation.

f. Four 115/69 kV autotransformers.

g. Five 69 kV – 1200 A breakers arranged in two bays and miscellaneous substation equipment

The area occupied by the proposed expansion will extend the footprint of Wachusett No. 47 to approximately 4.7 acres. Construction of the proposed facilities will be performed in phases, as required by load growth on the transmission system. Please refer to Exhibit AJM-3, Proposed One Line Diagram. Initially only two of the proposed four 345/115 kV autotransformers and associated equipment will be installed. The

equipment shown in dotted lines on Exhibit AJM-3 will not be installed as part of phase one.

The substation will be built in accordance with the standards established by the American National Standards Institute (ANSI), the Institute of Electrical and Electronic Engineers (IEEE) and the National Electrical Safety Code (NESC). In addition, the substation will be operated with the high standards established by the Petitioner through years of experience and a proven long history of successful operation of similar facilities.

Q. Please explain the proposed schedule for construction.

A. NEP is eager to begin site preparation by June 2004, Construction will take some 18 months.

Q. What impact will construction and operation of the additional facilities have on the neighborhood?

A. Construction and operation of the substation will continue have minimal impact on the neighborhood. The construction schedule will be approximately 18 months from ground breaking through completion. Construction hours will be in accordance with local law, Monday through Friday; however, it will be necessary to work outside of these time periods

in order to minimize critical electrical equipment outages. The volume of traffic generated during construction is not expected to be large enough to significantly affect traffic flows on Temple Street. Construction noise in the neighborhood will be dampened because the substation is located approximately 1000' from Route 140 (Temple Street) and the Boston & Maine Railroad tracks, built on top of an 11 foot high earth berm, act as noise buffers. Once construction is completed, the substation will be unmanned and remotely operated. Substation traffic will consist only of periodic inspection trips and emergency work, if necessary. Outdoor lighting for the substation will be provided by 12 twin 400 watt high pressure sodium floodlights equipped with manual on/off switches. The lights will only be used in case of nighttime emergency work.

Q. Has the Company estimated noise impacts once the expanded substation is operational?

A. The Company conducted a sound survey to determine the effect that the proposed substation equipment will have on ambient levels in the vicinity. See Exhibit AJM-4. The study indicated that daytime ambient noise measurements range from 49 dBA to 51 dBA and nighttime ambient noise levels range from 51 dBA to 53 dBA. The proximity of Route 140 (Temple Street) and the train traffic along the railway create moderately high ambient noise levels at the Site. The Company will be purchasing

reduced noise transformers for the project. The sound survey performed by the Company showed that the addition of the proposed equipment will not have significant impact on noise levels at the Site property lines across from the abutting residences.

Q. Please explain the Company's analysis of electric and magnetic field issues.

A. The Company prepared a simulation of electric and magnetic filed profiles along the right-of-way assuming summer peak conditions for the existing facilities (year 2003) and under the same conditions assuming the addition of the proposed equipment (year 2006). See Exhibit AJM-5. The results are as indicated on the table below:

Location	Magnetic Field Strength (mG) – Summer Peak Loading	
	2003	2006
R/W south of the Substation:		
@ eastern edge of r/w	24	10
@ western edge of r/w	30	48
R/W north of the Substation:		
@ eastern edge of r/w	25	31
@ western edge of r/w	10	8

The electric field strengths at the same locations are expected to remain unchanged since the transmission lines will not be modified.

Q. Will the general public be able to enter the area?

A. There are two gates to prevent unauthorized access to the Site and substation. One gate is located at the beginning of the driveway, off Temple St., the other one is part of the fence enclosing the substation. During construction these gates will be padlocked at the end of the workday. Once construction is completed these gates will be padlocked at all times, although Company personnel will be able to enter the padlocked areas for maintenance work.

Q. Are you familiar with the details of the proposed transmission line relocations which will be necessary as a result of the proposed substation expansion in connection with which we are here today?

A. Yes, I am.

Q. Will you describe for the record, the scope of the proposed transmission line relocations?

A. At present, the two 345kV lines, designated the 314 and 343 Lines, bypass the Substation, as shown in Exhibit AJM-1. When the proposed substation expansion is complete, both lines will be relocated to new substation terminal structures, as shown in Exhibit AJM-2. Of the two 115kV lines, designated O-141N and P-142N, only the latter line presently terminates at the substation as shown in Exhibit AJM-1. After expansion, both lines will terminate at the substation, as shown in Exhibit AJM-2.

Finally, two 69kV lines will be slightly relocated to accommodate the new bus arrangement.

Q. Have you made inquiry with respect to the need for exemption from zoning in connection with the substations described in DPU 19561 and DPU 18352?

A. I have made such an inquiry and have learned that the Department has previously granted NEP zoning exemptions for the Wachusett No. 47 Substation. I have been advised by counsel that a comprehensive zoning exemption will be required before NEP can lawfully build and operate the proposed substation facilities.

Q. Based upon the evidence you have given and your personal experience and qualifications in the electric utility field and your knowledge of the situation with respect to this particular substation location, is it your opinion that the use of the land as proposed on this proceeding and the substation expansion on such lands are all reasonably necessary and convenient for the public?

A. This is my opinion.

Q. Does this conclude your testimony?

A. Yes, it does.

LIST OF EXHIBITS

AJM-1	Aerial Photo of Wachusett No. 47 Substation, West Boylston, Massachusetts
AJM-2	Proposed site Plan
AJM-3	Proposed One Line Diagram
AJM-4	Wachusett No. 47 Substation, West Boylston, Massachusetts [Noise Survey]
AJM-5	EMF Simulation – Wachusett Substation